PALOMAR ENERGY PROJECT (01-AFC-24)
CEC STAFF DATA REQUEST NUMBER 8

Technical Area: Air Quality **Response Date: April 8, 2002**

REQUEST:

Please discuss the effect that conducting construction activities 11 hours per day would have on the estimated air quality impacts. If necessary revise the construction emission estimates and ambient air quality modeling analysis to reflect the longer daily schedule of activity.

RESPONSE:

The basis for the construction emissions was provided in AFC Appendix E.2, which discusses the presumed average operating schedule over the entire construction period. This average operating schedule consists of eight hours per day of operation by each piece of construction equipment over the entire period. This schedule was assumed since, in general, construction equipment will be used for approximately eight hours per day. There may be instances where the construction day, including activities such as safety briefings, breaks, maintenance, and other periods of no pollutant emissions, could occur over a longer period during the day due to delays in the construction schedule. Although a construction "day" may be longer than eight hours, operation of any single piece of construction equipment will likely not last longer than eight hours per day.

However, to account for potentially longer construction periods up to 11-hours-per-day, the emissions and modeling analyses were revised to distribute the construction emissions over an 11-hour day. Emission estimates for this scenario are provided in Tables 8-1 through 8-5. The new modeling analyses were performed assuming an 11-hour day with construction beginning at 0700 Local Standard Time (hour ending 0800 in the ISCST3 model). Short-term averaging periods (i.e., 1, 3, and 8-hour averages) were modeled using the peak hourly emission rate that could occur anytime during the day.

For the daily (24-hour average) averaging periods, the modeled hourly emission rate was calculated as the peak daily emission rate divided by 11-hours-per-day. For annual averaging periods, the peak rolling 12-month average construction emissions were distributed evenly over an 11-hour day. Both the 24-hour and annual average emission rates account for eight hours of operation that could occur any time during the 11-hour day.

The construction modeling results reflecting an 11-hour day are provided in Table 8-6. Modeling an 11-hour construction day results in generally higher concentrations. For instance, the total peak 1-hour NO_2 concentration increased from 300 $\mu g/m^3$ for an eight-hour day to 359 $\mu g/m^3$ for an 11-hour day. The annual average NO_2 impact increased slightly, while the annual average SO_2 and PM_{10} impacts did not change. Peak 24-hour impacts decreased slightly due to the daily construction emissions distributed over more hours.

Although not requested with respect to public health, a revised diesel particulate risk assessment based on an 11-hour day was performed. Revised diesel particulate emissions to distribute the total diesel particulate emitted during construction over an 11-hour-per-day operating schedule are provided in Table 8-7. The revised peak cancer risk due to diesel particulate was 8.8 per million compared to 8.6 per million for an 8-hour day at the Point of Maximum Impact (PMI). The revised chronic hazard index due to diesel particulate was 0.24 at the PMI compared to 0.23 for an 8-hour day.

The revised modeling results assuming an 11-hour-per-day construction schedule do not result in a significant change in air quality impacts compared with the results provided in the AFC. The conclusions drawn from the original modeling results documented the AFC remain unchanged and hence a condition of certification is not needed to limit the hours of operation for construction.

Three CDs containing the supplemental 11-hour construction day modeling analyses have been provided with this submittal.

Table 8-1
Palomar Energy Project
Power Plant Construction Onsite CO Emissions Summary

Source	CO Emissions										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Onsite Construction Equipment (lbs/month)	5,105.55	5,459.78	5,654.78	5,875.60	7,685.85	7,861.73	8,099.12	7,802.92	8,065.56	8,065.56	8,973.21
Onsite Motor Vehicles (lbs/month)	5.92	5.92	5.92	8.89	8.89	10.37	10.37	10.37	10.37	11.12	11.12
Total (lbs/month)	**5,111.47**	**5,465.70**	**5,660.70**	**5,884.49**	**7,694.74**	**7,872.10**	**8,109.48**	**7,813.29**	**8,075.93**	**8,076.69**	**8,984.33**
Onsite Construction Equipment (lbs/hour)	38.56	42.59	44.36	46.39	59.83	61.36	63.83	61.11	63.29	63.29	69.63
Onsite Motor Vehicles (lbs/hour)[a]	0.03	0.03	0.03	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06
Peak Hourly (lbs/hr)[a]	**38.60**	**42.62**	**44.40**	**46.44**	**59.88**	**61.42**	**63.89**	**61.16**	**63.35**	**63.35**	**69.70**
Running Annual (tons/year)	**44.52**	**47.14**	**49.72**	**52.19**	**54.43**	**55.62**	**56.72**	**57.36**	**58.16**	**58.57**	**54.53**

Source	CO Emissions									
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Onsite Construction Equipment (lbs/month)	10,289.56	10,339.64	10,603.25	10,588.22	10,357.10	10,064.92	10,064.92	9,391.29	9,391.29	8,897.88
Onsite Motor Vehicles (lbs/month)	9.65	9.65	10.37	9.63	9.63	9.63	9.63	9.63	9.63	9.63
Total (lbs/month)	**10,299.21**	**10,349.29**	**10,613.61**	**10,597.85**	**10,366.73**	**10,074.55**	**10,074.55**	**9,400.92**	**9,400.92**	**8,907.50**
Onsite Construction Equipment (lbs/hour)	80.47	78.48	80.98	80.87	78.53	76.02	76.02	68.36	68.36	63.78
Onsite Motor Vehicles (lbs/hour)[a]	0.05	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Peak Hourly (lbs/hr)[a]	**80.52**	**78.53**	**81.04**	**80.92**	**78.58**	**76.07**	**76.07**	**68.42**	**68.42**	**63.84**
Running Annual (tons/year)	**50.04**	**44.89**	**39.72**	**34.41**	**29.11**	**23.93**	**18.89**	**13.85**	**9.15**	**4.45**

		Modeled Emission Rates (lb/hr/m2):	**PA1 Area (m2)**
Peak Hourly (lbs/hour)	**81.04**	9.949E-04	81455
Maximum Daily Hourly Average (lbs/hour)[b]	**43.86**	5.384E-04	
Maximum Annual (tons/year)	**58.57**		
Maximum Annual Avg. (lbs/hour)[c]	**29.18**		

[a] Based on 8 hrs/day, 22 days/month all equipment operating simultaneously

[b] Based on 22 days/month, 11hr/day total construction time

[c] Based on 11 hrs/day, 365 days/year

Table 8-2
Palomar Energy Project
Power Plant Construction Onsite VOC Emissions Summary

Source	VOC Emissions										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Onsite Construction Equipment (lbs/month)	330.76	360.47	383.41	413.04	495.70	508.49	540.28	486.13	542.42	542.42	608.96
Onsite Motor Vehicles (lbs/month)	0.96	0.96	0.96	1.43	1.43	1.68	1.68	1.68	1.68	1.77	1.77
Total (lbs/month)	**331.72**	**361.43**	**384.37**	**414.46**	**497.12**	**510.17**	**541.95**	**487.81**	**544.10**	**544.19**	**610.73**
Onsite Construction Equipment (lbs/hour)	2.70	3.04	3.24	3.52	4.19	4.29	4.61	4.20	4.63	4.63	5.10
Onsite Motor Vehicles (lbs/hour)[a]	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Peak Hourly (lbs/hr)[a]	**2.70**	**3.04**	**3.25**	**3.53**	**4.20**	**4.30**	**4.62**	**4.21**	**4.64**	**4.64**	**5.11**
Running Annual (tons/year)	**2.97**	**3.11**	**3.25**	**3.38**	**3.49**	**3.52**	**3.55**	**3.53**	**3.53**	**3.46**	**3.18**

Source	VOC Emissions									
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Onsite Construction Equipment (lbs/month)	708.98	608.48	643.90	641.17	627.06	568.08	568.08	488.83	488.83	396.23
Onsite Motor Vehicles (lbs/month)	1.52	1.52	1.68	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Total (lbs/month)	**710.50**	**610.00**	**645.58**	**642.72**	**628.61**	**569.63**	**569.63**	**490.38**	**490.38**	**397.78**
Onsite Construction Equipment (lbs/hour)	6.01	5.08	5.42	5.40	5.23	4.71	4.71	3.81	3.81	2.96
Onsite Motor Vehicles (lbs/hour)[a]	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Peak Hourly (lbs/hr)[a]	**6.02**	**5.09**	**5.43**	**5.41**	**5.24**	**4.72**	**4.72**	**3.82**	**3.82**	**2.97**
Running Annual (tons/year)	**2.88**	**2.52**	**2.22**	**1.89**	**1.57**	**1.26**	**0.97**	**0.69**	**0.44**	**0.20**

Peak Hourly (lbs/hour)	**6.02**
Maximum Daily Hourly Average (lbs/hour)[b]	**2.94**
Maximum Annual (tons/year)	**3.55**
Maximum Annual Avg. (lbs/hour)[c]	**1.77**

[a] Based on 8 hrs/day, 22 days/month all equipment operating simultaneously

[b] Based on 22 days/month, 11hr/day total construction time

[c] Based on 11 hrs/day, 365 days/year

Table 8-3
Palomar Energy Project
Power Plant Construction Onsite NO_X Emissions Summary

Source	NO_X Emissions										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Onsite Construction Equipment (lbs/month)	1,066.51	1,157.92	1,316.22	1,527.94	1,694.81	1,775.94	2,002.97	1,798.90	2,119.63	2,119.63	2,308.34
Onsite Motor Vehicles (lbs/month)	11.45	11.45	11.45	17.41	17.41	20.16	20.16	20.16	20.16	22.00	22.00
Total (lbs/month)	**1,077.96**	**1,169.38**	**1,327.67**	**1,545.35**	**1,712.22**	**1,796.10**	**2,023.13**	**1,819.06**	**2,139.79**	**2,141.63**	**2,330.34**
Onsite Construction Equipment (lbs/hour)	9.64	10.68	12.12	14.07	15.88	16.53	18.79	17.58	20.10	20.10	21.42
Onsite Motor Vehicles (lbs/hour)[a]	0.07	0.07	0.07	0.10	0.10	0.11	0.11	0.11	0.11	0.13	0.13
Peak Hourly (lbs/hr)[a]	**9.71**	**10.75**	**12.19**	**14.17**	**15.98**	**16.64**	**18.90**	**17.69**	**20.22**	**20.23**	**21.55**
Running Annual (tons/year)	**10.96**	**11.50**	**12.14**	**12.68**	**13.07**	**13.21**	**13.30**	**13.01**	**12.83**	**12.12**	**11.05**

Source	NO_X Emissions									
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Onsite Construction Equipment (lbs/month)	2,808.70	2,157.68	2,410.84	2,390.06	2,315.15	1,969.57	1,969.57	1,422.74	1,422.74	718.44
Onsite Motor Vehicles (lbs/month)	19.26	19.26	20.16	18.79	18.79	18.79	18.79	18.79	18.79	18.79
Total (lbs/month)	**2,827.95**	**2,176.93**	**2,431.00**	**2,408.85**	**2,333.94**	**1,988.35**	**1,988.35**	**1,441.53**	**1,441.53**	**737.22**
Onsite Construction Equipment (lbs/hour)	26.42	20.82	23.27	23.11	22.06	19.04	19.04	12.82	12.82	6.32
Onsite Motor Vehicles (lbs/hour)[a]	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Peak Hourly (lbs/hr)[a]	**26.53**	**20.93**	**23.38**	**23.22**	**22.17**	**19.14**	**19.14**	**12.93**	**12.93**	**6.43**
Running Annual (tons/year)	**9.89**	**8.47**	**7.39**	**6.17**	**4.97**	**3.80**	**2.80**	**1.81**	**1.09**	**0.37**

		Modeled Emission Rates (lb/hr/m2):	**PA1 Area (m2)**
Peak Hourly (lbs/hour)	**26.53**	3.258E-04	81455
Maximum Daily Hourly Average (lbs/hour)[b]	**11.69**		
Maximum Annual (tons/year)	**13.30**		
Maximum Annual Avg. (lbs/hour)[c]	**6.63**	8.136E-05	

[a] Based on 8 hrs/day, 22 days/month all equipment operating simultaneously

[b] Based on 22 days/month, 11hr/day total construction time

[c] Based on 11 hrs/day, 365 days/year

Table 8-4
Palomar Energy Project
Power Plant Construction Onsite SO_X Emissions Summary

Source	SO_X Emissions										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Onsite Construction Equipment (lbs/month)	27.11	30.76	34.43	39.34	43.55	45.43	50.69	44.42	51.86	51.86	56.40
Onsite Motor Vehicles (lbs/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (lbs/month)	**27.11**	**30.76**	**34.43**	**39.34**	**43.55**	**45.43**	**50.69**	**44.42**	**51.86**	**51.86**	**56.40**
Onsite Construction Equipment (lbs/hour)	0.25	0.29	0.32	0.37	0.41	0.43	0.48	0.43	0.49	0.49	0.52
Onsite Motor Vehicles (lbs/hour)[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peak Hourly (lbs/hr)[a]	**0.25**	**0.29**	**0.32**	**0.37**	**0.41**	**0.43**	**0.48**	**0.43**	**0.49**	**0.49**	**0.52**
Running Annual (tons/year)	**0.27**	**0.28**	**0.30**	**0.31**	**0.32**	**0.32**	**0.32**	**0.31**	**0.31**	**0.29**	**0.26**

Source	SO_X Emissions									
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Onsite Construction Equipment (lbs/month)	68.17	51.71	57.58	57.10	55.36	47.35	47.35	34.67	34.67	18.34
Onsite Motor Vehicles (lbs/month)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total (lbs/month)	**68.17**	**51.71**	**57.58**	**57.10**	**55.36**	**47.35**	**47.35**	**34.67**	**34.67**	**18.34**
Onsite Construction Equipment (lbs/hour)	0.64	0.49	0.55	0.55	0.52	0.45	0.45	0.31	0.31	0.16
Onsite Motor Vehicles (lbs/hour)[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Peak Hourly (lbs/hr)[a]	**0.64**	**0.49**	**0.55**	**0.55**	**0.52**	**0.45**	**0.45**	**0.31**	**0.31**	**0.16**
Running Annual (tons/year)	**0.24**	**0.20**	**0.18**	**0.15**	**0.12**	**0.09**	**0.07**	**0.04**	**0.03**	**0.01**

		Modeled Emission Rates (lb/hr/m2):	**PA1 Area (m2)**
Peak Hourly (lbs/hour)	**0.64**	7.866E-06	81455
Maximum Daily Hourly Average (lbs/hour)[b]	**0.28**	3.458E-06	
Maximum Annual (tons/year)	**0.32**		
Maximum Annual Avg. (lbs/hour)[c]	**0.16**	1.956E-06	

[a] Based on 8 hrs/day, 22 days/month all equipment operating simultaneously

[b] Based on 22 days/month, 11hr/day total construction time

[c] Based on 11 hrs/day, 365 days/year

Table 8-5
Palomar Energy Project
Power Plant Construction Onsite PM_{10} Emissions Summary

Source	PM_{10} Emissions										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Onsite Construction Equipment (lbs/month)	19.86	21.00	30.18	39.83	49.81	61.71	75.52	82.34	91.90	91.90	93.89
Onsite Motor Vehicles (lbs/month)	0.64	0.64	0.64	0.97	0.97	1.12	1.12	1.12	1.12	1.23	1.23
Fugitive PM_{10} (lbs/month)	95.22	95.22	139.23	180.16	180.16	196.53	196.53	174.99	196.53	212.91	234.45
Total (lbs/month)	**115.72**	**116.86**	**170.04**	**220.96**	**230.95**	**259.37**	**273.18**	**258.45**	**289.56**	**306.04**	**329.57**
Combustion (lbs/month)	**20.50**	**21.64**	**30.82**	**40.80**	**50.79**	**62.84**	**76.64**	**83.46**	**93.02**	**93.13**	**95.12**
Onsite Construction Equipment (lbs/hour)	0.17	0.18	0.26	0.35	0.46	0.56	0.70	0.79	0.87	0.87	0.88
Onsite Motor Vehicles (lbs/hour)[a]	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM_{10} (lbs/hour)a	0.54	0.54	0.79	1.02	1.02	1.12	1.12	0.99	1.12	1.21	1.33
Peak Hourly (lbs/hr)[a]	**0.71**	**0.73**	**1.06**	**1.38**	**1.49**	**1.68**	**1.82**	**1.79**	**1.99**	**2.08**	**2.22**
Combustion Peak Hourly (lbs/hr)[a]	**0.17**	**0.18**	**0.27**	**0.36**	**0.46**	**0.57**	**0.70**	**0.79**	**0.87**	**0.88**	**0.89**
Running Annual (tons/year)	**1.45**	**1.53**	**1.62**	**1.67**	**1.70**	**1.71**	**1.72**	**1.69**	**1.68**	**1.64**	**1.49**
Running Annual Combustion (ton/yr)	**0.39**	**0.43**	**0.48**	**0.52**	**0.55**	**0.57**	**0.59**	**0.58**	**0.57**	**0.55**	**0.50**
Running Annual Fugitive (ton/yr)	**1.06**	**1.10**	**1.14**	**1.15**	**1.15**	**1.14**	**1.13**	**1.11**	**1.11**	**1.09**	**0.99**

Source	PM_{10} Emissions									
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Onsite Construction Equipment (lbs/month)	116.26	100.48	109.43	108.06	105.60	95.50	95.50	63.80	63.80	43.35
Onsite Motor Vehicles (lbs/month)	1.08	1.08	1.12	1.05	1.05	1.05	1.05	1.05	1.05	1.05
Fugitive PM_{10} (lbs/month)	218.08	174.99	174.99	166.80	166.80	166.80	166.80	166.80	166.80	166.80
Total (lbs/month)	**335.41**	**276.55**	**285.54**	**275.91**	**273.45**	**263.35**	**263.35**	**231.65**	**231.65**	**211.20**
Combustion (lbs/month)	**117.34**	**101.55**	**110.55**	**109.11**	**106.64**	**96.55**	**96.55**	**64.85**	**64.85**	**44.40**
Onsite Construction Equipment (lbs/hour)	1.11	0.96	1.04	1.03	0.99	0.91	0.91	0.55	0.55	0.38
Onsite Motor Vehicles (lbs/hour)[a]	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fugitive PM_{10} (lbs/hour)[a]	1.24	0.99	0.99	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Peak Hourly (lbs/hr)[a]	**2.36**	**1.96**	**2.04**	**1.99**	**1.94**	**1.86**	**1.86**	**1.50**	**1.50**	**1.33**
Combustion Peak Hourly (lbs/hr)[a]	**1.12**	**0.96**	**1.05**	**1.04**	**0.99**	**0.91**	**0.91**	**0.55**	**0.55**	**0.38**
Running Annual (tons/year)	**1.32**	**1.16**	**1.02**	**0.88**	**0.74**	**0.60**	**0.47**	**0.34**	**0.22**	**0.11**
Running Annual Combustion (ton/yr)	**0.46**	**0.40**	**0.35**	**0.29**	**0.24**	**0.18**	**0.14**	**0.09**	**0.05**	**0.02**
Running Annual Fugitive (ton/yr)	**0.87**	**0.76**	**0.67**	**0.58**	**0.50**	**0.42**	**0.33**	**0.25**	**0.17**	**0.08**

		Modeled Emission Rates (lb/hr/m2):	**PA1 Area (m2)**
Peak Hourly (lbs/hour)	**2.36**		81455
Peak Hourly Combust. (lbs/hour)	**1.12**		
Peak Hourly Fugitive (lbs/hour)	**1.33**		
Maximum Daily Hourly Average (lbs/hour)[b]	**1.39**		
Maximum Combustion Daily (lbs/hour)[b]	**0.48**	5.952E-06	
Maximum Fugitive Daily (lbs/hour)[b]	**0.97**	1.189E-05	
Maximum Annual Total (tons/year)	**1.72**		
Maximum Annual Combust. (tons/year)	**0.59**		
Maximum Annual Fugitive (tons/year)	**1.15**		
Maximum Annual Avg. (lbs/hour)[c]	**0.85**		
Maximum Annual Combust. (lbs/hour)[c]	**0.29**	3.607E-06	
Maximum Annual Fugitive (lbs/hour)[c]	**0.57**	7.055E-06	

[a] Based on 8 hrs/day, 22 days/month all equipment operating simultaneously
[b] Based on 22 days/month, 11hr/day total construction time
[c] Based on 11 hrs/day, 365 days/year

Table 8-6
Palomar Energy Project
Estimated Construction Ambient Air Quality Impacts for an 11-Hour Day

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	Background[1] ($\mu g/m^3$)	Total Predicted Concentration[2] ($\mu g/m^3$)	Ambient Air Quality Standard[3]
NO_2	1-hour	208.5[4]	150.2[4]	358.7	470
	Annual	65.6[6]	---[6]	65.6[6]	100
CO	1-hour	5,974	11,870	17,844	23,000
	8-hour	2,194	6,123	8,317	10,000
SO_2	1-hour[5]	47.2	397	444	655
	24-hour	3.4	53	56	105
	Annual	0.8	8	9	80
PM_{10}	24-hour	19.6	65	85	50
	Annual	5.1	28.5	34	30

[1] Background air quality data obtained from the Escondido station, except SO_2 is from the Chula Vista monitoring station.
[2] All concentration totals rounded to three or fewer significant figures.
[3] Most stringent of federal or state ambient air quality standard for each pollutant and averaging period.
[4] The ozone limiting method (OLM) was used to estimate the worst-case NO_2 impacts. The 1-hour background NO_2 concentration was determined to be the hour that resulted in the peak ozone limited impacts (including background NO_2 for each hour).
[5] The maximum 1-hour impact with background for SO_2 is also below the 3-hour (1,300 µg/m3) AAQS.
[6] Annual average NO_2 was computed as the annual average of the ozone limited 1-hour impacts. Background annual NO_2 concentrations are not obtainable using this method, therefore the total impact (project plus background) is presented in this table.

Table 8-7

Palomar Energy Project

Power Plant Construction Onsite Diesel Particulate Emissions Summary

	CO (lb/hr)	VOC (lb/hr)	NO_x (lb/hr)	SO_2 (lb/hr	PM_{10} all Combustion (lb/hr)	PM_{10} (Diesel) (lb/hr)	Soot Filter
Air Compressor, Ingersol-Rand	1.07	0.00	0.00	0.00	0.011	0.011	Yes
Asphalt Paver, Cat AP-8008	0.16	0.00	0.00	0.00	0.011	0.011	
Compactor, Cat CS-563	0.13	0.05	0.00	0.00	0.002	0.002	Yes
Backhoe, Cat, 312	0.40	0.19	0.00	0.00	0.003	0.003	Yes
Loader, Cat, 938F	0.13	0.03	0.00	0.00	0.002	0.002	Yes
Motor Grader, Cat 140G	0.25	0.04	0.05	0.00	0.003	0.003	Yes
Trencher, Cat, E70B	0.31	0.08	1.48	0.00	0.017	0.017	
Crane, 225-Ton, Manitowoc, 4100W	0.87	0.02	0.24	0.00	0.030	0.030	
Crane, 150-Ton, Manitowoc	0.69	0.09	0.27	0.05	0.024	0.024	
Crane, 40-Ton, Grove, TR700B	1.56	0.05	0.41	0.03	0.054	0.054	
Crane, 20-Ton, Grove, TR400	0.99	0.10	0.17	0.01	0.034	0.034	
Welder, Multiquip, GA 3800 [a]	26.75	0.08	0.48	0.01	0.003		
Welder, Multiquip, BLW-300SS	0.39	0.18	0.24	0.01	0.025	0.025	
Truck, Concrete Pump, International	1.25	0.12	0.71	0.00	0.003	0.003	
On-site Motor Vehicles	0.04	0.01	0.08	0.00	0.003	0.003	
Totals	35.00	1.04	4.12	0.10	0.225	0.222	

Soot filter control efficiency 85%

Area Source Area 81455 square meters

Annual emissions based on 11 hr/day

[a] Gasoline-fueled welder

Modeled Emission Rate for Diesel HRA	
lb/hr-m^2	2.722E-06